PRINCIPLES AND METHODS

—OF—

EXAMINATION

—IN—

ORTHOPÆDIC PRACTICE.

By Henry Ling Taylor, M. D.,

—OF—

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PRINCIPLES AND METHODS OF EXAMINATION IN ORTHOPÆDIC PRACTICE.*

BY HENRY LING TAYLOR, M. D.,
OF NEW YORK.

The investigation and treatment of joint affections and of deformities has won for itself a place as a distinct department of surgery, having its peculiar problems and special methods. The New York Orthopædic Society—now the Section on Orthopædic Surgery of the New York Academy of Medicine—founded some five years ago, and the American Orthopædic Association, founded two years ago, formally introduce the specialty into the sisterhood of organized medicine.

Scientific orthopædy is thus seen to be a rather recent arrival; and its principles and methods being still to a considerable extent under discussion, very little that is practical or reliable in the

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matter of methods of examination and early diagnosis has found its way into surgical teaching or general medical literature in such a manner as to become the common property of the profession.

As in several other branches of medicine the development of orthopædy has been hindered on the one hand by indifference, from a sort of surgical fatalism, like the common lay notion that in a case where only slight symptoms are present no treatment is needed, and when they are severe none is of avail; on the other hand by too great a willingness, not wholly confined to the laity, to entrust the solution of purely scientific problems to unscientific and untrained minds; one of the numberless varieties of that endless problem, how to get something out of nothing. The type of mind that sees in ophthalmology only a question of spectacles, will regard orthopædy as a question of braces—an error encouraged, it must be admitted, by much in special literature and practice—and as in the one case the peddler, the shop-keeper or the optician is appealed to, so in the other the blacksmith and the instrument-maker are consulted; and with similar results.

There is however at present a demand for the careful and intelligent study of

joint and spinal affections, and it is vitally important that all should be familiar with reliable methods of examination and diagnosis.

My present object is to emphasize a few principles, which seem to me helpful in the recognition and discrimination of the early stages of the more common chronic affections of the spine and larger joints, especially the hip and knee, rather than to present an exhaustive study of methods or symptoms.

There is hardly any class of cases where so much good can be accomplished or so much evil prevented by an early diagnosis as in these affections. Early recognition of the seat and nature of the disease, which in the vast majority of cases rests with the family physician, with employment of treatment adapted to meet the indications present, will often enable the surgeon to arrest the disease, prevent deformity and save life, while an error in diagnosis or too much reliance on the hope that the beginning trouble "will be outgrown," is as frequently followed by consequences disastrous to the patient and distressing to the physician.

As many of the chronic joint and spinal diseases begin insidiously, and frequently without pain, or without char-

acteristic pain—a fact long ago pointed out by Dr. C. Fayette Taylor*—it is easy to understand how the trouble may be for a long time overlooked, and when discovered its gravity underestimated.

Unless the symptoms follow directly on some traumatism or begin more acutely than is usual, we find that the attention of friends is generally first attracted by some peculiarity or awkwardness of gait or attitude, later by lassitude, disinclination to move about as freely as usual, restlessness at night, constitutional disturbance, and pain; and each of these symptoms calls for careful examination on the part of the physician, who should never rest satisfied until he has traced it to its source.

It is well known that the vast majority of our acts, movements and vital processes are involuntary and automatic, impressed upon the individual by his inheritance and experience through reflex mechanisms and easily modified by strong or unusual stimuli, whether from the outside world or from within the body itself. It is just these associated reflex movements

*1. The Mechanical Treatment of Angular Curvature or Pott's Disease of the Spine.—New York State Medical Society, 1865: and

2. On Some of the Elements of Diagnosis in the Different Stages of Diseases of the Hip Joint.—The Medical Record, May 8th, 1875.

and the tonicity of special muscular groups which require the closest study and give us the most valuable information in joint disease. As in health the temperament, occupation and even social standing† of an individual, and the more transient stimuli of heat, hunger, fatigue and their opposites, become stamped upon his expression, muscular tonicity, gait and attitude, so that we can tell a sailor from a landsman, a craftsman from a headworker, or a tired man from one who is fresh, by noticing the thousand phases of associated movements, so disease and particularly disease affecting the bony framework or joint structure of the body, conditions characteristic groupings of the ordinary attitudes and movements. Much that is really due to physical disability of one kind or another is charged to awkwardness or heedlessness. Joint and spinal troubles are a common but by no means the only cause of the disturbance.

A little girl who was always stumbling and breaking things and seemed to exercise small powers of observation was cured at eight years of age by consult-

†A lady who passed a season at Carlsbad told me that she was able to distinguish the seven or eight nationalities there present by the gait and carriage, Austrians who tried to imitate the French and Americans who aped the English were more easily recognized by this test than any other.

ing an oculist and treating a previously unsuspected but extreme myopia.

A young lady was brought ao me for a peculiar stiffness or awkwardness of gait. After careful examination I found no joint disease or paralytic affection, nothing in fact but a slight lateral curvature and a narrow chest, which did not explain the symptom. I treated the spinal asymmetry and gave her the "Respirator" ‡ for chest development, but the awkward walking persisted. I had previously inquired into the existence of uterine symptoms which were denied, but I finally urged an examination of the pelvic organs by a specialist. He found such severe retroflexion that he expressed surprise that she could walk at all.

Small tubercular foci in the spongy tissue of a vertebra or near the end of a long bone may remain comparatively quiescent for months or years, or give rise only at times to trifling lameness or some peculiarity of movement or attitude, and afterwards the disease encroach on the neighboring joint, and slowly and perhaps unconsciously modify muscular action and joint mobility, or else more

‡For description of the "Respirator" and its uses see an artic'e entitled "The Therapeutic va'ue of Systematic Respiratory Movements."—Medical Record, May 4th. 1889.

rapidly produce severe and painful symptoms. Yet it is certain that a careful investigation of the causes of the periods of slight lameness or other disturbance, would in many cases have easily revealed the seat and nature of the irritation in time to have made possible the prevention of serious damage.

With this general idea of what we are to look for, how shall we proceed at the examination?

While the history of the case is being taken, the facies, attitude and movements of the patient, who ought not to be made to feel himself the object of attention, should be carefully observed. It will be important to notice whether the patient is well-nourished, and whether his appearance or movements indicate fatigue, strain or suffering, for the anxious and drawn countenance is often present in joint disease when local pain is denied. While the patient is undressing—every child should be disrobed—any movements indicating general irritation or local disability or distress should be carefully noted.

The patient should then be made to walk, get into and out of a chair, and pick something up from the floor. Analysis of the movements, and especially of the gait, will, in the majority of cases,

indicate the correct diagnosis, even before the appearance of conscious pain or deformity. Indeed the orthopædic surgeon makes these observations instinctively as the patient walks into the room, and usually has a provisional diagnosis, which leads his line of inquiry by the time the patient is seated.

It is not necessary to describe in detail the gait and attitude characteristic of the various joint, spinal and paralytic affections. I merely wish to urge the vital importance of close observation of everything connected with movement and expression, since these will give us vastly more definite information than the patient's impressions in regard to his own condition, and may be quite as important as the results gained from local inspection.

As the countenance is apt to bear an anxious expression, so the movements are exceedingly apt to be cautious and protective in these beginning joint troubles. The patient takes exceeding "care" that the back or limb shall not be subject to sudden jars or wrenches; he perhaps lifts his limb with his hands in changing his position, or rests his chin on his palms to protect his vertebrae. This "care," or instinctive effort at protection, is usually present in some degree

unless in the earliest and the youngest cases, and is exceedingly characteristic, but is to be carefully distinguished from the conscious apprehensiveness, often very extreme, of the hyperæsthetic sufferer from functional joint troubles. I have elsewhere § tried to indicate the difference. In joint neurosis "disability of the most varied character and imperfect co-ordination of the neighboring muscular reflexes are among the most common symptoms, and the most characteristic one is the visible though often unconscious accommodation of the reflexes of the entire body to the condition of the disabled member. * * * * It is usually more distinct and more widely distributed than the secondary reflex adjustments in joint disease, and somewhat different in character, possibly due to greater prominence of the cerebral element. If the patient have a lame ankle he is, so to speak, "ankle all over;" if it be a young woman with a backache, she presents every evidence in her conscious and unconscious life of the paramount influence of that region of the body. If we may speak of "care" as referring to attitude and movements in joint diseases, we may possible charac-

§ "Hygiene of Reflex Action," Journal of Nervous and Mental Disease, March, 1888.

terize as "apprehension" the phenomena referred to in these functional troubles. The "care" of a diseased joint is most distinctly noticed in distant reflexes when the joint is hurt or threatened with violence. Pain, especially in the earlier stages of joint disease, is rather paroxysmal in character and often absent; the patient frequently forgets his trouble and hurts his joint by too spontaneous movement In a neurotic joint affection, pain, while more constant, is not invariably a prominent feature, but, no matter what the distractions of the patient, the remotest muscular reflexes of the body are in a would-be-protective state of apprehension in a typical case. This influence can often be distinctly perceived in the expression of the face and the tone of the voice, as well as in the peculiar mental attitude of the patient; the perceptions, emotions, and intellect will frequently revolve around a knee or a back for a centre as plainly as the muscular reflexes."

Proceeding now to the examination of local conditions, our object will be to critically estimate the tonicity and responsiveness of the muscular groups acting on the suspected joint, the position and mobility of the joint, and the physical appearance of the surrounding parts,

as to swelling, wasting and other deviations from the normal. In testing motion we always begin with the *sound* ‖ limb in order to eliminate apprehension and active participation as much as possible.

Suppose the hip is suspected. We make gentle movements at the hip, beginning on the sound side, while the patient is seated, and then ask him to cross one leg over the other; this he will be rarely able to do on the suspected side, if the joint is diseased.

The patient is then placed on his back on the flat examining couch and the gentle movements of the joint, always beginning on the sound side, are continued, one hand being firmly placed on the pelvis to ascertain whether it moves with the thigh, the object being rather to determine the quality than the quantity of motion. Such tests in various directions will almost infallibly reveal the greater or less "reluctance to relax" (independent of cerebral interference), usually with more or less jerky spasmodic action of certain muscles and limitation of motion so characteristic of joint disease from the earliest stage. The crucial test will be to turn the patient upon his face and test hyper-extension,

‖ Dr. C. Fayette Taylor's invariable practice so long as I can remember.

(sound side first), where limitation will invariably be evident if joint trouble is present.

I have said little about pain because as a diagnostic sign it is not to be depended upon. We know that knee pain often exists with hip disease, and that it is perhaps still more often absent. When present the hip should always be examined. Cases where all pain is denied until the disease is well advanced are not rare; and hip or knee pain may exist with no joint disease at all. Irritability and restlessness at night, with cries or night-mare, are much more suggestive of joint disease in the early stages than local pain, and these may be present in marked degree without conscious or remembered pain. This being the case, it is difficult to imagine the object of the rough manipulations so often seen in surgical examinations of the joints. Whether or not pain or tenderness is elicited by these procedures no information of value is derived, and they are not free from danger. I remember very well a young man shown at a medical meeting, who seemed to be suffering from a diseased hip, of whom a noted surgeon then present stated that he was sure that when he first examined him some months previous no joint disease existed,

but admitted the possibility of the starting up of the disease from his rough manipulations. When such results are possible from methods not rarely employed, is it not time to call a halt, even if the use of violence were not as stupid as it is dangerous? I have seen other patients who have been frightened and cruelly hurt at examinations; any approach to roughness defeats the object of the examination and should not be tolerated.

In the knee we have a joint very often affected and admirably fitted by its size and accessibility for investigation, but mistakes in diagnosis, especially as between functional and organic disease, are exceedingly common. We test here also the tonicity and activity of the muscles, and if bone enlargement or synovial distension is present these can hardly escape close observation. Too much attention to pain and tenderness about the joint will only distract our attention from the really diagnostic features. There will be no organic disease of the joint without reflex muscular spasm, or without some limitation of extension at the knee. No matter how painful the joint, if complete extension without violence is possible, disease of the joint can hardly be present; and it is to be remembered that functional knee trouble, which

is often accompanied by pain and limitation of motion, is exceedingly common, whether as a primary affection or following in the wake of some slight injury.

These patients will sometimes relate a history not inconsistent with that of joint disease, but I have learned to take a patient's estimate of appearances and conditions with considerable allowance. They will often relate that swelling has existed or still exists, when measurements show the affected limb to be the smaller of the two. Restraint of a limb will usually cause an appreciable wasting with a change of contour, which the patient, fearing inflammation, takes for swelling; and it is also true that actual swelling, especially a boggy relaxation of the tissues, may exist, and that a state of local malnutrition and consequent organic disability may follow.

Some of these cases have a habit of keeping the knee stiffly extended while sitting, a position impossible to the sufferer from joint disease. Careful analysis of the facts developed by the general and local examinations should make the diagnosis clear.

In many of these cases the functional nature of the trouble has been clearly recognized, but either it has been aggravated by local treatment, which is un-

certain and sometimes harmful in its effects, or the sufferer has lost confidence from being told that "there is nothing the matter," a statement which besides being untrue adds a new difficulty to the management of the case.

Many get well without being diagnosed, under the routine treatment of iodine, blisters, firing, local applications, bandages, etc., but many prove exceedingly obstinate until their real nature is recognized and indicated treatment adopted, when an apparently hopeless deformity or disability often clears up like magic.

In suspected caries of the vertebrae a careful study of attitude and movements, alone suffices to enable us to make the diagnosis with great certainty, and in most cases before the appearance of deformity.

"There is a peculiar carefulness in the step; an instinctive poising of the body to avoid all shocks; an indescribable expression of the whole person and every attitude and motion, which exists in this disease, and in this disease alone. The toes are turned slightly inward; the shoulders and elbows are drawn backward; the chin is thrown upward; the gait is sliding; the patient catches hold of objects in passing them, and

when he stops, he leans heavily on his mother's lap or whatever object may be near him. All this indicates the presence of the disease as clearly as a peculiar eruption indicates the measles."*

The back muscles are rigid and the sufferer reaches the hand down by the side in picking an object from the floor to avoid stooping. If to these symptoms pain in the side or bowels, restlessness at night and a careworn look are added the presence of deformity† is hardly needed to complete the picture.

"And we should always bear in mind, when this disease is suspected, that to wait for the projection to appear is to wait for the destruction of the vertebrae. It is to throw away the golden moment for arresting the disease in its incipiency. We must remember that the curvature is the result of the disease and not the disease itself."

Pain referred to the terminal filaments of the intercostal and lumbar nerves in the side and abdomen is frequently an early and always a suggestive symptom but is not rarely absent. But the spinal tenderness so sedulously sought for by many is never present unless from the

*1. Op. cit. 1.

†2. It should be remembered that an *angular lateral* deformity sometimes appears early in this disease.

too frequent or too vigorous efforts of the examiner, or other adventitious cause. Pain in the back is seldom complained of and never characteristic of this condition. The only case of disease of the spine in which I saw it markedly developed, proved to be a cancer of the vertebrae.

For purposes of record rather than of diagnosis the patient should be placed on the examining couch, face down, and the spinal contour taken by means of a flexible lead strip, which is afterwards traced on pasteboard and kept for reference. The minutest changes in outline during the progress of the case can thus be readily recognized. These children should always be lifted by placing one hand under the seat, the other in front of the chest, and all the manipulations of the examiner should be of the gentlest; any rough handling is cruel, unnecessary and harmful.

The cases most easy to overlook are those that cannot walk. In a case of pressure paraplegia without marked deformity, seen some years ago, the vertebral disease escaped the notice of the attending physician and house staff, including myself, during six months of hospital treatment.

Lateral curvature of the spine, being a deformity due to loss of equilibrium,

not to bone disease, is not characterized by the special modifications of associated movements due to inflammatory processes, and the preliminary examination is relatively of less importance; but here, as in all orthopædic cases, the gait and attitude should be carefully studied. The history, especially as bearing on the temperament, mental habits, schooling, etc., of the patient should be thoroughly inquired into, and will often in early cases furnish the key to the causes and cure of the affection.

In making the examination, the back and hips of the patient should be exposed and the patient seated on a low stool before the examiner. In this position the contours of the body, hips, spine and shoulders can be observed, spinal mobility tested, and chest expansion measured. The patient then stands up, the back being still turned to the examiner, and while the patient stands squarely on the feet, the knees being straight, the horizontal hands of the examiner are forced inward over the iliac crests to ascertain any pelvic obliquity that may exist. After this has been done, if the patient bends forward at the hips until the body makes a right angle with the legs, the arms hanging, any rotation will be plainly shown. It is of less importance

to ascertain the exact line of the spinous processes than to study the lateral contours of the body, any fulness or flatness at the side of the spine, the position of the hips, and spinal mobility.

Too much stress should not be laid on backache or spinal tenderness; these are undoubtedly present in a certain proportion of cases but there is no necessary connection between them and ordinary lateral curvature, which, indeed, has no rational symptoms until rotation is so great as to cramp the viscera.

Spinal tenderness, usually superficial and often severe, and "backache" are nearly always referable to general causes or to the condition of the nervous system. In states of anæmia, nervous depression and brain-tire, backache and spinal tenderness are a characteristic symptom. These cases of "backache" may be exceedingly obstinate and distressing, but are usually amenable to hygienic and tonic treatment after the removal of the predisposing causes. Systematic active and passive movements are of great value and assist in that regulation of the psycho-physical life which is often essential to a cure.

Leaving aside round-shoulders, the diagnosis of which is obvious, nearly all the back cases which present themselves

will be found to fall into these three classes of spinal caries, lateral curvature and "backache," which it is of the utmost importance to clearly discriminate from the start, as the treatment is radically divergent.

I call particular attention in closing to:

1. The necessity for the critical analysis of any deviation from the normal carriage or locomotion, especially during the growing period, and for a careful study of expression and movement in its widest sense, as revealing the effect of general strain and local irritation.

2. The value of specially testing the tonicity of the muscle groups, acting upon a joint where disease is suspected.

3. The unreliability of pain and tenderness as a diagnostic sign in the early stages of joint disease, and the inadmissibility of rough manipulations to elicit them.

201 West 54th Street.